Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Miriam Barcellona Ingenito
Acting Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G. Brown Jr.
Governor

June 17, 2014

Mr. Ed Mopas
Environmental Manager
Exide Technologies
2700 South Indiana Avenue
Vernon, California 90058

Certified Mail: 01204700000952912 69

THIRD NOTICE OF DEFICIENCY FOR THE EXIDE TECHNOLOGIES, VERNON FACILITY PART B PERMIT APPLICATION, REVISION 7 PREPARED BY ADVANCED GEOSERVICES CORPORATION, DATED JANUARY 2013, U.S. EPA ID NUMBER CAD 097854541

Dear Mr. Mopas:

The Department of Toxic Substances Control (DTSC) has reviewed the Resource Conservation and Recovery Act Part A and Part B Permit Application (Application) for the Exide Technologies Vernon, California Facility (Facility), prepared by Advanced GeoServices Corporation, dated January 2013. Enclosed are DTSC's comments on the following Application parts: Closure Plan, Section 12; Closure Cost Estimate, Appendix P; and the Sampling and Analysis Plan, Enclosure A.

The enclosed memoranda include comments regarding the following deficiencies in the Closure Plan:

- Failure to accurately determine closure tasks, costs, and schedules for each hazardous waste management unit;
- Failure to provide accurate volumes of maximum waste inventory;
- The Closure Cost Estimate significantly underestimates the total cost due to calculation errors in transportation and disposal of wastes, and in quantities of drums required to remove and dispose of all wastes from the Facility;
- The Closure Cost Estimate does not utilize current third party costs, but escalates 2005 costs, which does not conform to the regulatory requirements;
- All miscellaneous units are not included in the unit descriptions, and therefore, there are inadequate closure costs represented in the estimate;
- All tank assessments required have not been submitted;
- The Closure Plan is ambiguous regarding what constitutes closure for the Facility; and

- The Sampling and Analysis Plan is deficient in providing the methodology for collection of soil and groundwater samples, and analytical test methods.

In addition, DTSC has the following comments on other parts of the Application:

Facility Information Section 1.2.2 C., Waste Management Devices and Permitted Units Section 5.3.2.1

This section of the Application describes the Raw Materials Preparation System (RMPS) at the Facility. The battery chips are described as being loaded into trailers and shipped off-site for recycling into battery casings and other plastic products. In recent site visits (e.g., April 18, 2014), and in the review of the Application, specifically photograph #23 of section 2, DTSC noted that a centrifuge exists in the RMPS for the purpose of removing liquids from the plastics prior to transferring, by blowing, the chips into the back of the trailers. DTSC considers this separation activity as treatment of a regulated waste stream. Therefore, DTSC requires that the centrifuge unit be included as an identified unit and fully described in the Application. The Application does not provide information as to when this activity began at the Facility. During one site visit by DTSC, on April 18, 2014, it was noted that the unit has been shown on prior city building permit drawings. However, the centrifuge unit utilized at the Facility is not in the Application drawings or figures. The Application must be updated to include this centrifuge treatment unit. The Closure Cost Estimate must also be updated to include the closure of this unit.

Waste Management Devices and Permitted Units Section 5.5

Operating a containment building requires owners and operators to follow the requirements of California Code of Regulations, title 22, sections 66264.1100 through 66264.1102. During the DTSC site visit on April 18, 2014, DTSC made several observations of the operations at the Facility. Several factors led DTSC to believe that the requirements of these regulations should apply to the entire building structure including the feed rooms, the RMPS Building, the Baghouse Building, the Smelter Building, and the Finished Lead Storage Building. The factors that support the application of these requirements are: 1) there exist interior openings between all the buildings which essentially create one large building where free transfer of airborne particulates/constituents can occur; 2) the roll-up doors that could close off the feed rooms/corridor from the rest of the buildings are non-functional and damaged; 3) there is significant visual evidence of feed materials and liquids transferring between buildings through interior doors and corroded sheet metal walls.

Visual evidence of the transfer of solid waste materials and liquid waste through exterior roll-up doors, through corroded sheet metal on exterior walls, and into the base of damaged concrete, suggests that the requirements of the cited regulations may not be met by Exide. Additionally, holes in ceilings and gaps between roof structures and walls

allow exterior elements to enter the structures. These gaps and holes exist in all structures at the Facility.

The Closure Cost Estimate must also be modified to include the dismantling and disposal of the RMPS Building, the Baghouse Building, the Smelter Building, and the Finished Lead Storage Building.

Waste Management Devices and Permitted Units, Section 5.6.1.1, 5.6.1.2, and Figures 5.1 and 5.2

In the Application, there is no discussion of the operation of the receiving and refining furnaces (as referenced in the June 24, 2009, SCAQMD Title V Permit to Operate) as hazardous waste management devices/units. As noted in the DTSC site visit on April 18, 2014, both the Reverb Furnace and the Blast Furnace feed receiving kettles via launders. These receiving kettles in turn feed refining kettles, at which point the molten lead is transferred to the various molds to make the "hogs," "pigs," and "billets." The Application states: "The lead tapped from the permitted Reverb Furnace is collected in the soft lead refining kettles for ***further processing to remove any remaining metallic impurities***" and "During the process of recovering lead from the permitted Blast Furnace, lead is tapped and collected into the hard lead refining kettles ***where alloy lead is prepared according to the customer specifications***" (emphasis added). However, the receiving and refining kettles are not included as hazardous waste management devices/units in the Application.

In previous iterations of the Application, these units were included. Exide must include these units in the Application and all drawings must be updated to include these processes.

Further, the Closure Cost Estimate for the Facility must also be modified to reflect the closure of the receiving and refining kettles.

Note that California Code of Regulations, title 22, section 66266.100(c) states that lead refining furnaces that qualify under federal law as conditionally exempted Boiler and Industrial Furnace (BIF) units are subject to regulation in California as Miscellaneous Units.

Waste Management Devices and Permitted Units

There exist several open top tanks within the Waste Water Treatment Plant at the Facility that operate with minimal freeboard. The tank assessments indicate that seismic sloshing cannot be contained within the limits of the tanks and would most likely be contained within secondary containment. The Reaction Tanks 1 through 5 are sufficiently close to the edge of secondary containment (some are within approximately, 1 foot of the outer wall) and therefore the potential exists for the release of hazardous waste outside of secondary containment. Exide shall modify its operational procedures

to increase freeboard, or physically alter the tanks to prevent the overtopping of all open top tanks due to seismic sloshing effects.

Also, all required tank assessments as listed in the October 29, 2013, DTSC Memorandum (enclosed) shall be submitted as part of Exide's application. Any hazardous waste management units that are not currently identified in the Application shall be included in the revised submittal. Any hazardous waste management units not included in the revised Application will not be allowed to continue to operate until such time as the units are incorporated into the Hazardous Waste Facility Permit through a permit modification approved by DTSC. Further, the Application must be updated to include all stormwater system activities/changes as a result of implementing the requirements of the Stipulation and Order Docket HWCA: P3-12/13-010.

Exide must submit a revised complete Application package within 30 days of receipt of this Third Notice of Deficiency. If Exide's submission is substantially incomplete or substantially unsatisfactory, DTSC is required to initiate permit denial proceedings under Health and Safety Code 25186 and 25200.8, and California Code of Regulations, title 22, section 66271.1, et seq. If you have any questions regarding this letter or any of the enclosures, you may call me at (916) 255-3605.

Sincerely,

William P. Veile, P.E. C46306
Office of Permitting

Enclosures

cc: Mr. E.N. DeSart
Sr. Director Commercial Operations
Exide Technologies
13000 Deerfield Parkway, Bldg. 200
Milton, Georgia 30004

Mr. John Hogarth
Plant Manager
Exide Technologies
2700 South Indiana Street
Vernon, California 90058

Mr. Paul Stratman
Ms. Jen DiJoseph
Advanced GeoServices
1055 Andrew Drive, Suite A
West Chester, Pennsylvania 19380-4293

Mr. Edwin L. Pupka
Senior Enforcement Manager
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

Mr. Thomas Strang
Exide Technologies
13000 Deerfield Parkway, Bldg. 200
Milton, Georgia 30004

Mr. Frederick Ganster
Exide Technologies
3000 Montrose Avenue
Reading, Pennsylvania 19605

Department of Toxic Substances Control

Deborah O. Raphael, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Matthew Rodriquez
Secretary for
Environmental Protection

Edmund G. Brown Jr.
Governor

MEMORANDUM

TO: William Veile, P.E.
Hazardous Substances Engineer
Office of Permitting
Hazardous Waste Management Program

VIA: Juan Koponen, Unit Chief
Engineering and Special Project Office
Brownfields and Environmental Restoration Program

FROM: Tamara Zielinski, P.E.
Hazardous Substances Engineer
Engineering and Special Projects Office
Brownfields and Environmental Restoration Program

Jesus I. Sotelo, P.E.
Hazardous Substances Engineer
Engineering and Special Projects Office
Brownfields and Environmental Restoration Program

REGISTERED PROFESSIONAL ENGINEER
TAMARA S ZIELINSKI
No. 56322
Exp. 12/31/14
CIVIL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
JESUS IGNACIO SOTELO
C 67508
EXP. 06/30/15
CIVIL
STATE OF CALIFORNIA

SUBJECT: REVIEW OF THE CLOSURE AND POST CLOSURE CARE COST ESTIMATE FOR PERMIT RENEWAL AND BANKRUPTCY COURT CLAIM, EXIDE TECHNOLOGIES, VERNON, CALIFORNIA, SITE CODE 300214

DATE: May 5, 2014

DOCUMENTS REVIEWED

1. *Part B Permit Application, Section 12, Closure Plan,* February 2014, Revision No. 7, by ADVANCED GEOSERVICES, West Chester Pennsylvania prepared for Exide Technologies.
2. *Part B Permit Application, Appendix P, Closure Cost Backup Documentation,* February 2014, Revision No. 7, by ADVANCED GEOSERVICES, West Chester Pennsylvania prepared for Exide Technologies.

INTRODUCTION

Staff of the Engineering and Special Projects Office of the Department of Toxic Substances Control (DTSC) have reviewed the Closure Plan and Closure Cost Estimate documents referenced above to determine their compliance with the requirements of California Code of Regulations, Title 22 (22 CCR), Sections:

66264.112. Closure Plan
66264.111. Closure Performance Standard
66264.142. Cost Estimate for Closure
66264.144. Cost Estimate for Postclosure Care
66264.114. Disposal or Decontamination of Equipment, Structures and Soils.
66264.115. Certification of Closure.

The following main compliance issues were identified by DTSC staff:

1. The Closure Plan provided general and summarized information and did not contain a detailed description of the steps necessary for the closure of each Hazardous Waste Management Unit by a third party in accordance with 22 CCR 66264.112;
2. The Closure Cost Estimate: include several calculation errors, used inaccurate waste quantities, and did not use current unit costs in accordance with 22 CCR 66264.142;
3. The Cost Estimate for Postclosure Care used present value costs instead of directly multiplying the annual postclosure care cost by the 30 year postclosure care period pursuant to 22 CCR 66264.144 and it does not include sufficient costs for Units requiring closure as a landfill;
4. Due to the gross contamination of onsite structures and the storm drain system it is unlikely that complete decontamination of the structures and subsurface soils will be achieved (see photo documentation in Attachment A) and cannot be assumed as part of the CCE, and
5. Pursuant to 22 CCR 66264.114, the contingent closure costs will need to include costs for: demolition and disposal of the on-site structures, removal of five feet of soil beneath the structures, closure of the facility and performance of post-closure care in accordance with the closure and post-closure requirements that apply to landfills (22 CCR 66264.310).

All comments included in this memorandum will need to be addressed in a revision of the Closure Plan and Cost Estimate Documentation.

The following sections of this memorandum contain: (1) a summary of the Closure Plan and Closure Cost Estimate; (2) general comments by DTSC staff regarding compliance with the applicable Title 22 requirements; and (3) detailed comments regarding the assumptions used for the basis of the Closure Cost Estimate.

CLOSURE SUMMARY

Exide Technologies Lead Recycling (Exide) Facility is located at 2700 South Indiana Street Vernon, California 90058. Since 1922 the facility has been used to recover lead from automotive batteries and other lead-bearing materials received from off-site and generated on-site from the lead smelting process. As part of the Hazardous Waste Permit application, the operator of the Exide Facility submitted Closure Plan and Closure Cost Estimate documentation. These documents are summarized below.

The Exide Closure Plan identifies 78 Hazardous Waste Management Units (Units) on Table 2.2. The Units include: 56 Interim Status Units requiring Closure, 21 Units in the process of Closure, and 1 Closed Unit. These Units are shown on the attached (Attachment C) general layout map of the Exide Battery Recycling Facility, Figure 2.2 of the Closure Plan.

A general sequence for Closure was provided in Section 4.2 of the Closure Plan for the following Closure Areas shown on Figure 2.2:

- Container Storage Areas (Units 1, 2, 3)
- RMPS Building (Units 5, 6, 12, 13, 14, 40, 41, 42, 43, 66, 68, 70)
- Containment Building (Units 33, 34, 51)
- Desulfurization Area (Units 7, 8, 9, 10, former 64, former 65, 67)
- Oxidation Tank Area (Units 24, 25)
- Rotary Kiln (Unit 69)
- Furnace Building (Units 36, 37)
- Mobile Equipment Wash Station (Unit 35)
- North Flue Dust Slurry Tank and Sump (Unit 31)
- South Flue Dust Slurry Tank and Sump (Unit 32)
- Drop Out System (Units 46, 47, 48, 49, 50) and Stormwater Management System
- RMPS Building Filter Presses (Units 44, 45)
- Storm Water Surface Impoundment (Unit 78) and
- WWTP Area (Units 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 71, 72, 73, 74, 75, 76, 77)

The following General Approach for Closure of these Units was provided in Section 3.1 of the Closure Plan:

- Removal of remaining recyclable materials for transport to another facility for lead recycling.
- Removal of accumulated waste from tanks, container storage areas, miscellaneous equipment, and containment buildings.

- Following removal of the accumulated waste, equipment, structures and buildings will be decontaminated. The necessary decontamination effort and performance standard for the decontamination effort will be a function of the proposed disposition of the items in question.
- Soils and soil vapor beneath and adjacent to hazardous waste management units, will be sampled to demonstrate that the hazardous waste operations have not impacted underlying soils. When evaluating impacts caused by HWMUs, consideration regarding historic impacts associated with non-HWMUs will be required in many areas. Soils and soil vapor exceeding the performance standard discussed in Section 3.2 will be excavated, or removed, unless alternate closure performance standards are approved by DTSC. Adequacy of remediation will be documented using confirmatory sampling.
- Stormwater piping abandoned in-place during the 2013-2014 Stormwater System Removal and Replacement Project will be excavated and disposed off-site.
- Excavation areas, if any, will be restored by backfilling with clean imported fill materials as recommended by the DTSC's Information Advisory or nonhazardous recycled concrete and masonry rubble generated on-site to promote drainage and stabilized with concrete, pavement or stone.
- The replacement stormwater management system will be cleaned and left in-place.

Specific closure activities for each unit were summarized in Table 2.4 of the Closure Plan.

The Closure Plan provided the following Closure Schedule for the Exide Facility:

Exide Facility Closure Schedule

• 180 day notice of intent to close	August 20, 2027
• Final receipt of "wastes"	February 15, 2028
• Maximum "waste" inventory removed	April 30, 2028
• Furnace building secured	May 31, 2028
• Permitted units confirmed decontaminated	June 15,2028
• RMPS Reverb feed room secured	June 30, 2028
• Plant pavement powerwash complete	July 10, 2028
• Storm water surface impoundment powerwash complete	July 20, 2028
• Storm water Discharge Pipe construction complete	July 31, 2028
• Inspection/Certification	August 5, 2028
• Closure complete	August 15, 2028
• Initial Post-closure period	Until August 2058

The estimated quantity of waste to be sent off-site during closure is provided for each Closure Area in Table 5.1 of the Closure Plan and is summarized in Section 5.2 as follows:

- 16,235 gallons acid disposed off-site;
- 139,360 batteries, 282 drums, 5,952 cy feed material, and 787 cy paste reclaimed at an off-site secondary lead smelter;
- 4 cy non-hazardous material disposed off-site; and,
- 251 cy hazardous material disposed off-site.

An estimated 4,846,231 gallons of waste will be processed on site in a temporary Wastewater Treatment Plant during closure.

According to Section 5.2.1 of the Closure Plan most of the hazardous waste has value, due the high lead content, and could be reclaimed at a secondary lead smelter in Mexico approximately 135 miles away. The following lead content for the reclaimable waste was provided is Section 2.4.1.2 of the Closure Plan.

Battery Manufacturing Material	**Lead Content**
Auto plates and separators	72%
Industrial plates and separators	80%
Formed plates or groups	92%
Dry oxide	85%
Wet oxide	65%
Sump mud	50%
Pot dross	90%
Baghouse dust	60%

Section 20 of the Closure Plan provides the following estimated cost for the Closure and Postclosure Care of the 56 Interim Status Units is provided in:

Closure Cost	$5,107,366
Contingent Closure Cost	$4,037,620
Post-Closure Cost	$ 307,254
Contingent Post-Closure Cost	$1,120,979
Total	$10,573,219

Closure Cost Backup Documentation was provided in Appendix P of the Permit Application.

DTSC GENERAL COMMENTS

1. **Closure Plan:** In general the Closure Plan lacked the detail necessary to determine accurate closure: tasks, costs, and schedules for each Hazardous Waste Management Unit as required by 22 CCR 66264.112. The Revised Closure Plan shall include a description of each Units tasks and timing necessary for the closure of each Hazardous Waste Management Unit at the facility by a third party pursuant to 22 CCR 66264.112(b)(1). The description of the Unit shall, at a minimum, include: (a) design parameters, (b) process flow diagrams, and (c) layout plans of sufficient detail to determine the Unit size, (d) Unit maximum capacity, (e) the volume of support and containment structures, and (f) the length of associated piping in accordance with standard engineering practices. This information shall serve as a basis for the Unit closure: tasks, cost, and schedule. Tasks, costs, and schedules for each Unit shall have a consistent Work Breakdown Structure (WBS) in accordance with standard quality practices. The WBS for each Unit can be combined to develop a comprehensive WBS to support the description of the final closure of the facility at the maximum extent of the operations pursuant to 22 CCR 66264.112(b)(3)

2. **Maximum Inventory of Waste:** The volumes of the maximum inventories of hazardous waste provided on Table 1.1 of the Closure Plan do not match the volumes calculated from the Unit dimensions listed on Table 1.1. For example Table 1.1 lists the following information for the South Acid Storage Tank, Unit 10.

Unit 10 the South Acid Storage Tank			
Table 1.1 of the Closure Plan		**Volume Based on Tank Dimensions**	
Tank Size	**Maximum Inventory**	**Maximum Inventory**	**Delta**
13' 9" dia x 16' 3.75" h	13,650 gallons	18,095 gallons	4,445 gallons
Volume Formula 3.14*((13.75/2)^2)*16.3*7.48			

The Closure Plan shall be revised to include an accurate estimate of the maximum inventory of hazardous wastes on-site over the active life of the facility. This estimate shall include a detailed description of the: physical (e.g., density) and chemical characteristics of the waste, methods to be used during partial and final closure, including, but not limited to methods for removing, transporting, treating, storing or disposing of all hazardous waste, and identification of and the type(s) of off-site hazardous waste management unit(s) to be used pursuant to 22 CCR 66264.112(b)(3).

3. The **Closure Cost Estimate Documentation** in Appendix P included detailed cost estimates for the closure, postclosure, contingent closure, and contingent postclosure of each Hazardous Waste Management Unit. The Closure Cost Estimate documentation was provided on a 44 page hard copy, not on a

spreadsheet that could be quickly checked. DTSC staff reviewed the documentation and found significant errors: including a significant underestimate of the truck loads required for removing the Hazardous Waste Inventory from the facility, major calculation errors, and out-of-date unit costs escalated from 2005. These errors have resulted in a substantial underestimation of the closure costs.

For example, the Maximum Inventories of Hazardous Waste were provided in volume based measurements (cubic yards and gallons) and conversion factors were used to determine the number of transport loads and disposal costs. The following table provides the conversion factors used for the Closure Cost Estimate and the Conversion Factors Based on the average lead content of the reclaimable waste provided in the Closure Plan.

Closure Cost Estimate Conversion Factors	
Closure Cost Estimate Factors	**Factors Based on Average Lead Content**
2,250 pounds per 55 gallon drum of solids	3,870 pounds per 55 gallon drum of solids
1.4 tons/cubic yard of bulk waste	7.1 tons/cubic yard of bulk waste

Based on this information the transport and disposal of the reclaimable lead waste would be weight governed. A standard dump truck weight limit is 18 tons of waste. Due to the high lead content of the reclaimable waste the transport of the waste would be limited by weight, and only 2.5 cubic yards of waste could be transported per truck load instead of 13 cubic yards. This substantially increases the transport and disposal cost for the waste. The conversion factors in the cost estimate shall be revised to consider the density of the lead content of the waste that was included in section 2.4.1.2 of the Closure Plan and shown below.

Battery Manufacturing Material	**Lead Content**
Auto plates and separators	72%
Industrial plates and separators	80%
Formed plates or groups	92%
Dry oxide	85%
Wet oxide	65%
Sump mud	50%
Pot dross	90%
Baghouse dust	60%

The Closure Cost Estimate contained calculation errors that lead to large discrepancies in the hazardous waste volumes and closure costs. For example, the Closure Cost Estimate states the following:

622 cy / 3.7 drum/cy = 168 (55-gallon drums),

However, the correct equation is:

622 cy * 3.7 drum/cy = 2,302 (55-gallon drums).

These discrepancies resulted in a significant under estimate of the closure costs by several million dollars. The closure cost estimate shall be revised to include accurate volumes and cost calculations.

The Closure Cost Estimate unit costs were based on outdated R.S. Means Unit Costs from 2005 (plus inflation) instead of the current (2014 R.S. Means) unit costs as required by 22 CCR 66264.142(a). In the following Detailed Comment Section DTSC staff provides detailed comments on the assumptions used for the Exide Closure Cost Estimate and current 2014 Means Unit Costs. The outdated costs in the estimate resulted in a significant under estimation of the Closure Costs. The Closure Cost Estimate shall be revised to include current unit costs as shown in the detailed comments and to address additional comments provided herein by DTSC staff.

4. During a **site inspection** DTSC staff found: gross contamination of the buildings and subsurface drainage systems, evidence of spills inside the containment buildings on the concrete floor and running out from spaces under the containment building doors, and corrosion and cracking of the metal and cement structures as shown in the following photographs and photographs included in Attachment A.

Based on these observations DTSC staff determined that demolition of the buildings and removal of at least five feet of contaminated soil under the buildings would be necessary for the closure of the facility pursuant to 22 CCR 66264.112(b)(4). The Closure Plan and Cost Estimate shall be revised to include the demolition and disposal of the structures using the current costs provided in the following detailed comments, unless sample results indicate the soil is clean and the structures can be decontaminated and certified by a California Structural Engineer to be able to withstand the Maximum Considered Earthquake.

To minimize the chance for errors during the development of the Revised Closure Cost Estimate, a standardized closure cost estimate program may be used. Updated unit costs are provided on the following table of DTSC detailed comments.

DTSC DETAILED COMMENTS

The following table provides a side by side comparison of the assumptions used in the February 2014 Closure and Postclosure Cost Estimate and the revised assumptions recommended by DTSC. DTSC staff has included revised assumptions in blue.

Closure and Post Closure Cost Estimate Assumptions	
Exide Permit Application Appendix P Cost Estimate Documentation Assumptions February 2014	**DTSC Revisions April 2014**
Unit cost reference: RS Means 2005, Environmental Remediation Cost Data, 11th Edition; Location Factor 1.07. Unit costs increased for inflation through calendar year 2010. 2005 costs increased 12%. 2006 costs increased 7.8%. (CA Division of Labor Statistics & Research)	California Code of Regulations, Title 22 (22 CCR), Sections 66264.142 and 66264.144 require Owners or Operators of Hazardous Waste TSD to provide current cost estimates use Unit Cost Reference: RS Means Online 2014 1st Quarter, California
GENERAL ASSUMPTIONS	**GENERAL ASSUMPTIONS**
Contingency – 20%	Contingency = 20%
Contractor Overhead & Profit – 10%	Contractor Overhead & Profit = 10%
Quality Assurance – 10%	Quality Assurance = - 10%
	DTSC Oversight = 10%
Personnel Rates (2006 + inflation)	**Personnel Rates (2014 DTSC)**
Engineer - $153/hr	Senior Licensed Engineer = $199/hr
Secretary - $57/hr	Office Technician Typing = $73/hr
Attorney - $270/hr	Attorney - $517/hr (Exide Blended Rate)
Sampling Technician - $70/hr	Technician - $137/hr
5% duplicates for sampling (soil, concrete, gw)	5% duplicates for sampling (soil, concrete, gw)
Production Rates	**Production Rates** for OSHA Hazard Level C for all field work. Means 025613100020 OSHA Hazard Level C Productivity Decrease from Level D = 45% Labor and 45% equipment
Load 40 drums / hr	Load 22 drums / hr
Load 10 pallets / hr	Load 1 pallet / hr (75 batteries per pallet, each require inspection)
HEPA vacuum 750 sf / hr	HEPA vacuum 413 sf / hr
Pressure wash 105 sf floor / hr	Pressure wash and spray seal 29 sf floor / hr
Pressure wash 40 sf tank / hr	Pressure wash 22 sf tank / hr
Decon 1 front end loader/forklift/excavator / 4 hrs	Decon 1 front end loader/forklift/excavator / 7 hrs
Hand excavate 0.875 cy/hr	Hand excavate 0.48 cy/hr
Machine excavate 40 cy/hr	Machine excavate 22 cy/hr
Load waste into trucks and liquid into drums 73 cy /hr	Load waste into trucks and liquid into drums 40 cy /hr
Remove concrete floor 1.188 cy/hr	Remove concrete floor 0.65 cy/hr

Closure and Post Closure Cost Estimate Assumptions	
Exide Permit Application Appendix P Cost Estimate Documentation Assumptions February 2014	**DTSC Revisions April 2014**
CLOSURE ASSUMPTIONS	**CLOSURE ASSUMPTIONS**
Inventory Removal	**Inventory Removal**
75 batteries per pallet (BR)	75 batteries per pallet (BR)
4 drums per pallet (BR)	4 drums per pallet (BR)
2,250 lb per drum of solids (Permit Section 4.1.1.2)	3,871 lb per drum of solids based on average lead content of reclaimable waste (Closure Plan Section 2.4.1.2).
36 lb per battery (Permit Section 4.1.1.1)	36 lb per battery (Permit Section 4.1.1.1)
95% of Container Storage used for batteries, remainder for drums (Permit Section 4.1.1.2)	85% of Container Storage used for batteries, remainder for drums (Closure Plan 2.4.1.1).
Bulk waste 1.4 ton/cy (Muncie)	Bulk waste 7.1 tons/cy based on average lead content of reclaimable waste (Closure Plan Section 2.4.1.2).
Remaining product is recycled at secondary lead smelter (Oxidos y Pigmentos, Tijuana, B.C., 135 miles one way) at $0 disposal cost	Remaining product is recycled at secondary lead smelter (Oxidos y Pigmentos, Tijuana, B.C., 135 miles one way) at $0 disposal cost
RMPS Paste, slurry and sludge will be dewatered in filter press. Cake will be 20% of original volume and recycled at secondary smelter.	RMPS Paste, slurry and sludge will be dewatered in filter press. Cake will be 50% of original paste volume due to residual moisture and higher solids content per Appendix P Closure Cost Estimate Documentation, Waste Quantities Sheet.
The on-site WWTP and desulfurization system are assumed to not be functioning at closure.	The on-site WWTP and desulfurization system are assumed to not be functioning at closure.
Liquid will be processed through a temporary WWTP mobilized by the contractor.	Liquid will be processed through a temporary 350,000 gal per day WWTP purchased by the contractor at a cost of $2,782,500 (Means 460753100800)
Assume desulfurization system is not working and associated acid and paste are disposed off-site.	Assume desulfurization system is not working and associated acid and paste are disposed off-site.
Desulfurization system paste disposed of off-site without dewatering.	Desulfurization system paste disposed of off-site without dewatering and as hazards waste.
Decontamination	**Decontamination**
Pressure washing generates 4 gal/sf of wastewater in containment building, smelter building, and tanks with paste (Muncie & BR); 1.2 gal/sf in container storage areas, WWTP tanks, outdoor containment areas, building roofs (BR)	Pressure washing generates 4 gal/sf of wastewater in containment building, smelter building, and tanks with paste (Muncie & BR); 1.2 gal/sf in container storage areas, WWTP tanks, outdoor containment areas, building roofs (BR)

Closure and Post Closure Cost Estimate Assumptions			
Exide Permit Application Appendix P Cost Estimate Documentation Assumptions February 2014		**DTSC Revisions April 2014**	
Assume cost to treat liquids in temporary on-site WWTP is similar to treatment in onsite WWTP (Plant 2005 cost + inflation)		Assume cost to treat liquids in temporary on-site WWTP is similar to treatment in onsite WWTP with 2014 Means Master Mechanic Labor Rate and (2006 Cost to discharge to POTW + inflation)	
Chemicals 0.02 lb per gallon	$0.018	Chemicals 0.02 lb per gallon	$0.018
Electrical, 0.05 Kwh per gallon, $0.11/Kwh	$0.0006	Electrical, 0.05 Kwh per gallon, $0.11/Kwh (Corrected Math Error Electrical, 0.05 Kwh per gallon, $0.11/Kwh = $0.0055)	$0.0055
Water, 0.5 gallon per gallon, $2.04/1000 gal	$0.0010	Water, 0.5 gallon per gallon, $2.04/1000 gal.	$0.0010
Labor, $46.57/hr, 0.00008 hr/gallon	$0.0037	Labor, $64.00/hr, 0.00008 hr/gallon	$0.0051
Discharge to POTW, $1.20/1000 gal	$0.0012	2006 Cost to discharge to POTW + inflation = $0.0245/gal	$0.0245
$/gal	**$0.0245**	$/gal	**$0.0541**
WWTP operator = Master Mechanic = $43.79 per hour (2005 Means Crew XYBBP + inflation)		WWTP operator = Master Mechanic = $64.00 per hour (Means 2014 labor rate for Master Mechanic)	
310,000 gal/day = 12,917 gal/hr = 0.00008 hr / gal		310,000 gal/day = 12,917 gal/hr = 0.00008 hr / gal	
Decon floors and walls of buildings that house hazardous waste units. Decon roofs at all buildings. HEPA Vacuum $0.34/sf and Pressure wash $2.00/sf.		Decon floors and walls of buildings that house hazardous waste units. Decon roofs at all buildings. Per-cleaning, HEPA vacuum and wet wipe flat surfaces 0.34 $/sf (Means 28213420100). Metal building cleaning, water blasting up to 25,000 psi, 1750-3500 sf/day level C and Encapsulation with sealants walls and ceilings 2.30 $/sf (2014 Means 050110516225 and 028213480110).	
Decon interior of tanks with triple rinse (i.e., interior area x 3 = sf decontaminated). $5.26/sf		Decon interior of tanks with triple rinse (i.e., (interior area x 3) + (exterior area 1)= sf decon). $5.55 /sf (RACER Spray wash tank + 1.0508 escalation factor for 2014)	
Tank/Equipment Removal		**Tank/Equipment Removal**	
Crush plastic tanks to 25% of original volume prior to disposal as non-haz debris		Storage Tank Demo and Load on Trailer $1,422.72 (Means 026510300130)	
Recycle steel tanks and units as scrap metal. Transportation cost only, no resale value.		Haul to certified salvage dump 100 miles round trip $1,134 (Means 026510301029)	
Non-haz off-site disposal blast furnace contents ($42.06/cy LaPaz county Arizona, 2005 + inflation).		Hazardous waste off-site disposal for blast furnace contents. (Transport is weight governed) 18 ton load limit, 100 mile trip, $7.83/mile (Means	

Closure and Post Closure Cost Estimate Assumptions	
Exide Permit Application Appendix P Cost Estimate Documentation Assumptions February 2014	**DTSC Revisions April 2014**
	028120101270) Solid Pickup bulk material $642.61 (2014 Means 028120101120) Hazardous waste cleanup/pickup/disposal, dumpsite disposal charge, $448.20 per ton (Means 028120106020)
Reverb furnace contents to secondary smelter. Transportation cost only, no resale value.	Reverb furnace contents to secondary smelter. Transportation as hazardous waste. (Transport is weight governed) 18 ton load limit, 135 mile trip, $7.83/mile (Means 028120101270) Solid Pickup bulk material $642.61 (2014 Means 028120101120)
Dispose of furnace brick at hazardous landfill (25% of unit volume).	Dispose of furnace brick at hazardous landfill (25% of unit volume) (Transport is weight governed) 18 ton load limit, 100 mile trip, $7.83/mile (Means 028120101270) Solid Pickup bulk material $642.61 (2014 Means 028120101120) Hazardous waste cleanup/pickup/disposal, dumpsite disposal charge, $448.20 per ton (Means 028120106020)
Decon and recycle furnace steel structure as scrap. Transportation cost only, no resale value.	Decon furnace steel structure and dispose of as hazardous waste.
Dispose of 3" deep surface impoundment sediment at hazardous landfill ($302/ton, Means 33 19 7265 + inflation)	Dispose of 3" deep surface impoundment sediment at hazardous landfill:
2005 Plant transportation and disposal costs (not inflated):	Hazardous Waste Management:
$62/ton slag at non-haz landfill, LaPaz county, Arizona	Means 028120101100 Hazardous waste cleanup/pickup/disposal, solid pickup, 55 gallon drums $259.20 per drum
$1520/40 cy compacted trash / debris, non-haz landfill, LaPaz county, Arizona	Means 028120101130 Hazardous waste cleanup/pickup/disposal, solid pickup, bulk material, maximum $634.60 per ton
	Means 028120101270 Hazardous waste cleanup/pickup/disposal, transportation to disposal site, truckload = 80 drums or 25 C.Y. or 18 tons, maximum $7.83
	Means 028120106020 Hazardous waste cleanup/pickup/disposal, dumpsite disposal charge, max $448.20 per ton

Closure and Post Closure Cost Estimate Assumptions	
Exide Permit Application Appendix P Cost Estimate Documentation Assumptions February 2014	**DTSC Revisions April 2014**
	Building Demo
	Means 024116130020 Building Demolition Large Urban Project including 20 mile haul. No foundation or dump fees. C.F. is vol. of building, Steel Building 21,500 SF per day Crew B8. $0.28 cf
	Means 024119193080 Loading, Machine Loading Truck, $17.57 per CY
	Means 024119195100 Hauling 2 miles, Over 8 C.Y. truck $0.65 per CY
	Means 024119200500 Selective Demo, Dump Charges, typical urban city, tipping fee only, Reclamation Station $ 74/ton
	Means 0241131175500 Selective Demo, Concrete Floor 7" to 24" think, reinforced $126.30 per CY
	Dispose of concrete floor as hazardous waste
Stormwater Surface Impoundment	**Stormwater Surface Impoundment**
Maximum volume – 2,741,496 gallons (Permit Section 5.10.3)	Maximum volume – 2,741,496 gallons (Permit Section 5.10.3)
Floor area = 225ft x 50ft + 50ft x 100 ft = 16,250 sf	Floor area = 225ft x 50ft + 50ft x 100 ft = 16,250 sf
Liner system (top to bottom): 80 mil HDPE, geonet, 60 mil HDPE, 100 mil geotextile, geonet, 40 mil HDPE, 110 mil geotextile	Liner system (top to bottom): 80 mil HDPE, geonet, 60 mil HDPE, 100 mil geotextile, geonet, 40 mil HDPE, 110 mil geotextile
Facility area = (450 ft x 565 ft) + (1040 ft x 350 ft) + (200 ft x 350 ft) = 688,250 sf	Facility area = (450 ft x 565 ft) + (1040 ft x 350 ft) + (200 ft x 350 ft) = 688,250 sf
Average annual rainfall = 15.14 inches (National Weather Service, 1971-2000)	Average annual rainfall = 15.14 inches (National Weather Service, 1971-2000)
688,250 sf x 0.9 runoff coeff x 15.14 inches/12 = 781,508 cf stormwater = 5,845,679 gal	688,250 sf x 0.9 runoff coeff x 15.14 inches/12 = 781,508 cf stormwater = 5,845,679 gal
2006 Cost to discharge to POTW + inflation = $0.0245/gal	2006 Cost to discharge to POTW + inflation = $0.0245/gal
PPE	**PPE**
PPE not required for transportation and disposal, processing through filter press, treatment of wastewater, lab analysis, Calculation of risk based standards, loading of decontaminated tanks and debris, placement of clean fill and stone.	Assume OSHA HAZARD Level C for all field activities. OSHA Hazard Level C Productivity Decrease from Level D = 45% Labor and 45% equipment (Means 025613100020).

Closure and Post Closure Cost Estimate Assumptions			
Exide Permit Application Appendix P Cost Estimate Documentation Assumptions February 2014		**DTSC Revisions April 2014**	
CONTINGENT CLOSURE ASSUMPTIONS		**CONTINGENT CLOSURE ASSUMPTIONS**	
Remove 8" floor in 100% of furnace footprints, reverb furnace feed room, sumps 31, 32 and 35.		Remove 8" floor in 100% building footprints and dispose of as hazardous waste	
Remove liner/leak detection system at reverb furnace feed room		Remove liner/leak detection system at reverb furnace feed room	
Remove 8" floor in 10% of remaining areas and dispose as non-haz debris ($42.06/cy)		Remove 8" floor in 100% building footprints and dispose of as hazardous waste	
Dispose 10% of removed concrete/asphalt at hazardous landfill, 90% at non-hazardous landfill.		Dispose 100% of removed concrete/asphalt at hazardous landfill.	
Excavate 2 ft deep and dispose at hazardous landfill		Excavate 5 ft deep and dispose of soil at a hazardous landfill	
Backfill with 26 inches soil, 6 inches gravel		Backfill with 54 inches soil (Means 310513100200,310513100900,312323240600), Backfill with 6 inches of gravel (Means 310516100320, 310516100900, 312323240600)	
Confirmatory soil sampling - 1 per 1000 sf, 0-1 ft, minimum 5 per area		Confirmatory soil sampling - 1 per 1000 sf, 0-1 ft, minimum 5 per area	
Close Surface Impoundment with waste in-place, backfill for drainage, install cap (GCL, 60-mil HDPE, geonet, 6" XXXX concrete)		Close Surface Impoundment with waste in-place, backfill for drainage, install cap (GCL, 60-mil HDPE, geonet, 6" with rebar concrete)	
8 guard posts (bollard) per area to mark contaminated soil left in place		8 guard posts (bollard) per area to mark contaminated soil left in place	
Cap surface impoundment with waste-in-place		Cap surface impoundment with waste-in-place	
Decon of non-regulated areas		Decon of non-regulated areas	
688,250	sf, total plant area	688,250	sf, total plant area
-16012	sf, CSA floor	-16012	sf, CSA floor
-39,520	sf, Containment Building floor	-39,520	sf, Containment Building floor
-11,400	sf, RMPS floor	-11,400	sf, RMPS floor
-7,200	sf, Desulfurization Area floor	-7,200	sf, Desulfurization Area floor
-450	sf, Oxidation Tank Area floor	-450	sf, Oxidation Tank Area floor
-750	sf, Rotary Kiln footprint	-750	sf, Rotary Kiln footprint
-52,000	sf, furnace footprints in Smelter Building	-52,000	sf, furnace footprints in Smelter Building
-600	sf, Mobile Equipment Wash Station	-600	sf, Mobile Equipment Wash Station
-100	sf, N. Flue Dust Slurry Tank footprint	-100	sf, N. Flue Dust Slurry Tank footprint
-100	sf, S. Flue Dust Slurry Tank footprint	-100	sf, S. Flue Dust Slurry Tank footprint
-2,800	sf, Concrete Yard System	-2,800	sf, Concrete Yard System

Closure and Post Closure Cost Estimate Assumptions			
Exide Permit Application Appendix P Cost Estimate Documentation Assumptions February 2014		**DTSC Revisions April 2014**	
-450	sf, Equalization Tank footprint	-450	sf, Equalization Tank footprint
-400	sf, Unit 29 footprint	-400	sf, Unit 29 footprint
-400	sf, Unit 30 footprint	-400	sf, Unit 30 footprint
-1,400	sf, Drop Out System footprint	-1,400	sf, Drop Out System footprint
-6,600	sf, WWTP floor	-6,600	sf, WWTP floor
-42,600	sf, Baghouse Building	-42,600	sf, Baghouse Building
-16,250	sf, Stormwater Surface Impoundment	-16,250	sf, Stormwater Surface Impoundment
489,218	sf, unregulated area	489,218	sf, unregulated area
-70,000	sf, Main Office/Admin Building/Area east of Indiana Ave	0	sf, Main Office/Admin Building/Area east of Indiana Ave (Not include in Plant area)
-5,200	sf, Engineering Building	-5,200	sf, Engineering Building
414,018	sf, unregulated area requiring pressure washer	484,018	sf, unregulated area requiring pressure washer
POST CLOSURE ASSUMPTIONS		**POST CLOSURE ASSUMPTIONS**	
30 year period		30 year period	
Maintenance & repair of security system - replace 20 lf fence and 0.25 gates per year		Maintenance & repair of security system - replace 20 lf fence and 0.25 gates per year Chain Link Fence 8' H 6ga. Wire $37.74 (Means 32311320092). Gate 8' high, 12' opening $1,470.30 (Means 323113205080).	
Monthly inspections		Monthly inspections	
Collect stormwater, discharge to sewer		Collect stormwater, discharge to sewer	
Present worth determined OMB Circular A-94 Appendix C, 2.2% (per DTSC)		Per Section 66264.144 Cost Estimate for Postclosure Care. The postclosure cost estimate is calculated by multiplying the annual postclosure cost estimate by the number of years of postclosure care required under section 66264.117.	
CONTINGENT POST-CLOSURE		**CONTINGENT POST-CLOSURE**	
GW monitoring - quarterly for 30 years (lab filtered As, Cd, Pb, Zn; VOCs; sulfate; Turbidity; pH) (same analytes as current quarterly monitoring, $231/sample, Cal Science 2006 quote + inflation)		GW monitoring - quarterly for 30 years (lab filtered As, Cd, Pb, Zn; VOCs; sulfate; Turbidity; pH) (same analytes as current quarterly monitoring, $231/sample, Cal Science 2006 quote + inflation)	
GW monitoring - annually for 30 years (Appendix IX - total cyanide, Title 22 metals, organochlorine pesticides & PCBs, chlorinated herbicides, VOCs, SVOCs) $1,120 per sample, Cal Science 2006 quote + inflation		GW monitoring - annually for 30 years (Appendix IX - total cyanide, Title 22 metals, organochlorine pesticides & PCBs, chlorinated herbicides, VOCs, SVOCs) $1,120 per sample, Cal Science 2006 quote + inflation	

Closure and Post Closure Cost Estimate Assumptions	
Exide Permit Application Appendix P Cost Estimate Documentation Assumptions February 2014	**DTSC Revisions April 2014**
Monitoring at PW-1, PW-2, MW-5, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15 , MW-16 (12 wells, same as current quarterly monitoring). 12 wells sampled in 1 day	Monitoring at PW-1, PW-2, MW-5, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15 , MW-16 (12 wells, same as current quarterly monitoring). 12 wells sampled in 1 day
Maintain waste management area markers, 2 per year	Maintain waste management area markers, 2 per year
Deed notice	Deed notice
Certification of post-closure	Certification of post-closure
Present worth determined using I = 4% (interest rate of 7% minus inflation of 3% = 4%)	Per Section 66264.144 Cost Estimate for Postclosure Care. The postclosure cost estimate is calculated by multiplying the annual postclosure cost estimate by the number of years of postclosure care required under section 66264.117.

Attachment A

RMPS Paste Thickening Unit 12 – "Santa Maria"

Foundation Before March 5, 2014

Foundation After March 21, 2014

March 21, 2014

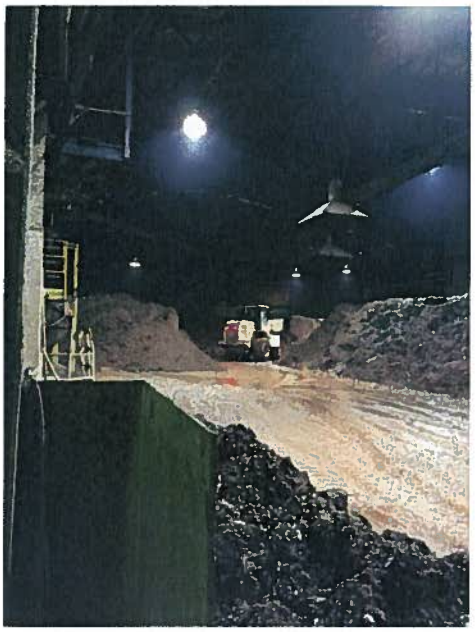
April 18, 2014

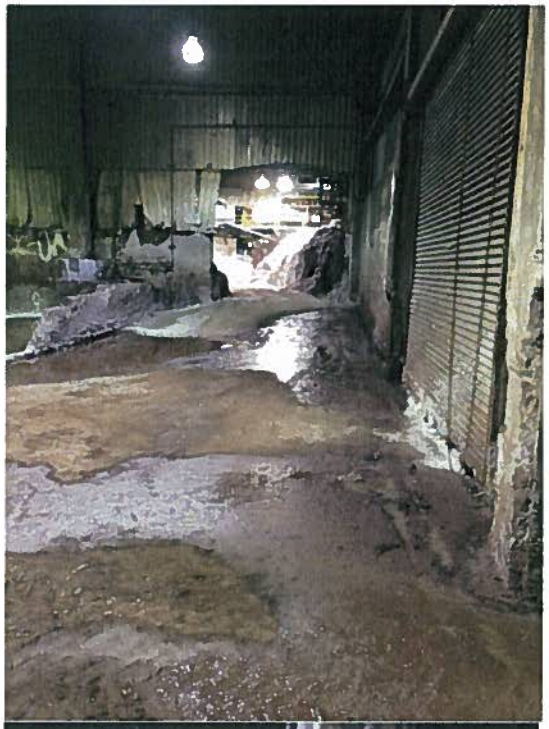
April 18, 2014

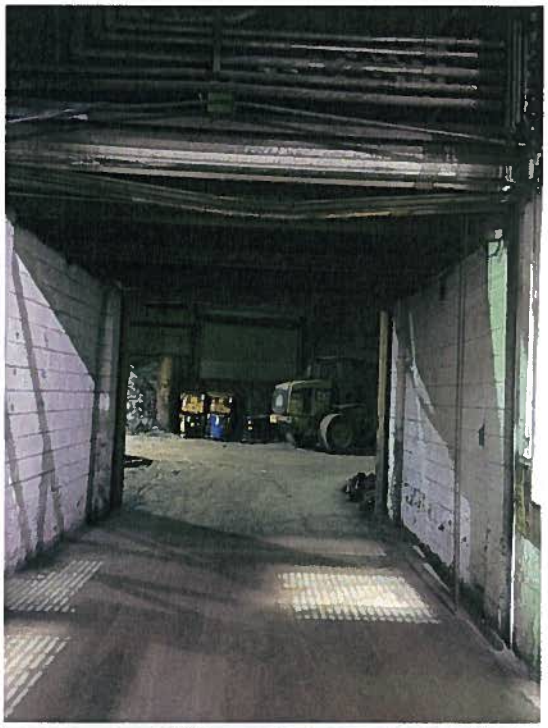
April 18, 2014

April 18, 2014

Reverb Furnace Feed Room, Corridor, and Blast Feed Room (Containment Building)







Refining/Receiving Kettles

Attachment B

Department of Toxic Substances Control

Deborah O. Raphael, Director
9211 Oakdale Avenue
Chatsworth, California 91311

Matthew Rodriquez
Secretary for
Environmental Protection

Edmund G. Brown Jr.
Governor

MEMORANDUM

TO: William Veile, P.E.
Hazardous Substances Engineer
Office Of Permitting

FROM: Todd Wallbom, P.G.
Engineering Geologist
Chatsworth Geological Services Unit

CONCUR: Craig Christmann, P.G.
Senior Engineering Geologist
Chatsworth Geological Services Unit

DATE: April 23, 2014

SUBJECT: Review of Section 12 (Closure Plan) of the Part B Application, Revision 7
Exide Technologies, Inc. Site
2700 South Indiana Street
Vernon, California 90058
Prepared by Advanced Geoservices Corp. (AGC)

PCA: 25040 Site Code: 300214 Phase: 33 MPC: 43 Log No: 20022399

As requested, Geological Services Unit (GSU) staff has performed a technical review of the draft *Closure Plan* (CP) of the Part B Application, and Attachment A, *Sampling and Analysis Plan* (SAP), Revision 7, dated February 13, 2014. The CP and the SAP were submitted by AGC on behalf of the Exide Technologies Corporation (Exide) facility ('Site' or 'Facility'), located at the address stated above.

GSU has reviewed the revised CP and SAP for conformance with technical adequacy, compliance with the California Code of Regulations (CCR), Title 22, Section 66264, the Department of Toxic Substances

Control (DTSC) Closure Plan Regulations, various guidance documents and standards, and general conformance to our comments issued in a memorandum dated January 3, 2011 on the previous iteration of the CP, or Revision 6b (dated July 23, 2010), our comments that were inserted electronically on the previous submittal of the CP (dated January, 2012), as well as our memorandum dated July 13, 2013. The SAP was reviewed in adherence to GSU's memorandum dated March 16, 2011.

The Exide facility in Vernon is an actively operating battery recycling facility. Prior to 1922 a portion of the property was occupied by a meat rendering plant while other areas were quarried for gravel. Since 1922, lead smelting and metals processing operations have occurred onsite.

Following our review, we do not concur with either the CP or the SAP and request that these documents be revised to adhere to our comments listed below.

Overall, GSU finds the CP and SAP to be slightly improved over previous submittals. However, due to the overwhelming number of comments (some of which are repeated from earlier memoranda); we request that both documents be revised accordingly.

Our comments on the revised documents are as follows:

COMMENTS:

1. Section 3.2.1, Cleanup Levels for Soils, Page 3 of 5: The discussion on performance standards is still unclear; particularly for clean closure of soils. Exide implies that performance standards will be based on either "background levels" or "risk based levels for industrial use". Organic compounds are mentioned as being screened using 'non-detect' as a cleanup level, however, use of the conjunction 'or' suggests that either situation may apply.

   DTSC policy states that industrial remediation levels cannot be used unless there is a land use covenant (LUC) restricting future uses of the property. For inorganics, concentrations should be compared to a site specific background level developed from collecting samples from areas known not to be contaminated. Inorganics elevated with respect to background typically become contaminants of concern (COCs) and are included in a Site risk assessment.

   To reiterate our Specific Comment No. 1 in our memorandum dated January 3, 2011, in order to demonstrate 'clean closure' for soils, Exide will need to provide results that are:

1. Non-detect for organic compounds and background levels for metals;
2. Below health risk based level for residential scenario, and/or
3. Below soil screening levels for groundwater and surface water protection.

We recommend inserting this language verbatim in the revised CP.

2. Section 3.2.7, Cleanup Levels for Groundwater, Page 4 of 5: By 'permit-defined background well', we assume that Exide is referring to recently-installed SI-1 which is meant to serve as a background well for the surface impoundment (Unit 78) only. Groundwater data from this well may not represent background conditions for any other hazardous waste management unit (HWMU) other than the surface impoundment. Additional wells, installed at a sufficient distance from a HWMU that cannot be clean-closed, will be needed to establish background conditions. Since we anticipate that many of the HWMUs will not be clean closed, we recommend that Exide include several additional wells in the CP, and the Closure Cost Estimate (CE).

3. The discussion regarding the option of placing a LUC on groundwater should be removed from the CP. If it is determined that groundwater may have been or has been impacted by constituents released from a HWMU, then cleanup to levels that are protective of human health and the environment, or to background (whichever is more conservative), will be required.

4. Section 3.2.8, Cleanup Levels for VOCs in Soil Vapor, Page 5 of 5: As noted above, if volatile organic compounds (VOCs) are detected in soil vapor and are at a concentration (or depth) that may present a threat to groundwater, then implementing a LUC on the vadose zone could not be considered as a viable option, without some remedial action that eliminates the threat to groundwater.

5. Section 5.0, Estimate and Management of Maximum Inventory, Pages 1-4: As requested in one of our comments on the January, 2012 revised CP, this section should be subdivided into two subsections:

    1. Permitted waste capacity
    2. The waste generated during closure

    The associated table could either be modified to suit or Exide may reference an existing table in the permit application.

6. Section 5.2, Management of Maximum Inventory, Pages 1 of 4: This discussion is still insufficient. The discussion does not state how much

material will be sent off-site as hazardous waste, California-hazardous (Cal-haz), or just 'waste'. This section should be revised to include:

1. Distance estimate to the offsite treatment facility.
2. Procedures to determine that the off-site facility is permitted to accept the waste, and how the waste will be treated or disposed
3. Procedures to determine that the off-site facility will comply with all federal and state regulations.

These elements should all be supported by the Closure CE.

7. Section 5.2.3, Solid Waste, Page 3 of 4: Blast furnace slag is typically classified as Cal-haz waste (please see California Waste Code 181) and not non-hazardous, and will need to be managed appropriately. The Closure CE may need to be adjusted as a result to account for the slag.

8. Section 7.2, Wipe Samples, Page 1: This section should refer to the SAP that describes the method for collecting and analyzing wipe samples. Also, per Chapter 3.7 – *Confirmation Sampling Plan for Containment Structures, Tanks, and Equipment*, of the Permit Writer's Manual, a wipe sample should be collected for every 300 square feet (sf) of building wall, not 500 sf. The Closure CE will likely need to be adjusted as a result.

   In addition, wipe samples may not be appropriate for every surface. For example, wipe samples are not appropriate for porous surfaces. Chip samples may be required for any other surfaces other than metal tanks, epoxy-coated surfaces, vinyl liners etc. These limitations should be noted in the CP.

   This section should also state that wipe samples will be biased towards areas where waste was managed or came into contact with the surface.

9. Section 7.5, Equipment Rinseate Sampling, Page 2 of 3: Exide should clearly identify the "small pieces of equipment" that cannot be wipe sampled and instead will have rinsewater sampled and analyzed to demonstrate that cleanup levels have been met. A table listing this equipment, and a rationale for rinseate sampling, should be included in the CP.

10. Section 8.3.2, Soil Vapor Sample Collection, Page 3 of 4: Collecting soil vapor samples at only one depth (five feet bgs) is insufficient and does not comply with DTSC's soil-vapor sampling guidance [*Advisory Active Soil Gas Investigations* (ASGI), dated April, 2012]. Soil vapor

samples should be collected, at a minimum, at depths of approximately 5 and 15 feet bgs. The deeper sample depth may vary based on field conditions encountered during drilling.

11. Section 10.1, Hydrogeologic Conditions, Page 1 of 1: This section will likely require revision to include new groundwater data collected as a result of the ongoing (2014) RFI.

12. Section 10.2, Groundwater Sampling, Page 1 of 1: We recommend that the following be included in the first sentence; "or if there is a statistically-significant evidence for a release from a unit".

13. Section 19.0, Contingent Post-Closure for Surface Impoundment and Units Closed with Waste in Place, Page 1 of 2: This section on contingent post-closure activities does not include soil pore liquid sampling, soil vapor sampling, surface water sampling, groundwater remediation or monitoring, or leak detection monitoring/sampling. The Contingent Post-Closure CE will likely need revision as a result.

14. Section 20.0, Closure and Contingent Post-Closure Cost Estimate, Page 1 of 1: As noted in the above comment, the Contingent Post-Closure CE does not include soil pore liquid, soil vapor sampling, surface water sampling, groundwater remediation/monitoring, or leak detection monitoring/sampling for the surface impoundment. In addition, the extent of groundwater contamination has not been adequately determined.

    The RFI, once completed, would essentially double the current number of monitoring wells (14). While we recognize that conditions are likely to change over time which will likely affect overall costs, it would be more realistic if monitoring and sampling the additional RFI wells were added to the CE.

    For the purposes of the CE, we also recommend increasing the average depth of soil contamination from 2 feet to at least 10 feet to account for in-ground sumps, the surface impoundment, and the underground piping.

15. Table 8-1, Analytical Test Method Summary, Closure Plan: This table should be modified to include soil vapor analysis using EPA Method TO-15 for VOCs.

16. Figure 7.1, Confirmatory Soil and Soil Vapor Sample Locations: No soil or soil vapor sample locations are shown for Unit 33 (Reverb and Raw Material Storage Area') on this figure. We recommend collecting

soil and soil vapor samples in Unit 33 and analyzing the samples for VOCs.

In addition to the proposed sampling locations, we recommend including additional soil samples adjacent to the mud tanks and acid tanks. These tanks are located in the Desulfurization Area/Mud Tank Building. Each tank should be surrounded by 4 soil borings located directly adjacent to the tank footprint. Some borings may be eliminated for those tanks that are sited close together providing that the spatial coverage is sufficient.

There is no soil vapor sample location proposed for Unit No. 34, 'Blast Furnace Feed Room'. At least one soil vapor sample location should be included here. The CE will likely need to be adjusted as a result. It is also unclear, based on this figure, if soil vapor sampling will occur at some of the smaller units (i.e., the 'Mobile Equipment Wash Station', the 'Truck Wash Sump', etc.). In addition, we recommend revising this figure so that soil vapor sample locations are more clearly presented.

17. Attachment A, Closure Plan, Sampling and Analysis Plan, Section 4.1, Wipe Samples, Page 1 of 4: As noted earlier, surface wipe samples should be collected once every 300 sf, not 500 sf as noted in the SAP.

18. Attachment A, Closure Plan, Sampling and Analysis Plan, Section 4.5, Soil Samples, Page 3 of 4: Exide should remove ' or immediately adjacent' near the top of Page 3 and replace with 'and immediately adjacent'. NOTE: the text has been changed from the 2012 version of the SAP. For future submittals, we recommend that Exide submit revised documents to DSTC in red-line/strike-out format so that changes to the document are apparent.

19. Attachment A, Closure Plan, Sampling and Analysis Plan, Section 4.5, Soil Samples, Page 4 of 4: At the top of Page 4, we recommend changing the text from "sampling for closed Units 64 and 65 will be addressed during corrective action" to " may be addressed". It is unlikely that all of the sampling requirements for these two units will be addressed by limiting sample collection along the exterior wall of the Desulfurization Area secondary containment.

20. Attachment A, Closure Plan, Sampling and Analysis Plan, Section 4.6, Soil Gas Samples, Page 4 of 4: As noted earlier, Exide should include soil vapor sampling at approximately 15 feet bgs for the soil vapor samples beneath the surface impoundment and the permitted units.

21. Attachment A, Closure Plan, Sampling and Analysis Plan, Section 5.1.5, Soil Sample Analysis, Page 1 of 2: We recommend including analysis for moisture content for the soil samples.

22. Attachment A, Closure Plan, Sampling and Analysis Plan, Section 5.1.6, Soil Gas Sample Analysis, Page 2 of 2: Instead of using EPA Method 8021, we recommend using EPA Method 8260B for soil vapor analysis. As noted earlier, soil vapor samples should also be analyzed for VOCs using EPA Method TO-15 at a frequency of 10% or 1 soil vapor sample analyzed using TO-15 for every 10 samples analyzed using EPA Method 8260B. Laboratory detection limits should be equal to or less than the residential California Human Health Screening Levels (CHHSLs) for soil vapor VOCs.

23. Attachment A, Closure Plan, Sampling and Analysis Plan, Section 6.7.4, Soil Sample Retrieval, Page 5 of 8: The discussion on collecting soil samples is overly generalized. Collecting blow count data may be required as part of closure activates. We recommend that Exide includes language in the SAP to state that the selection of the soil sample retrieval device (and drilling method) will be based on the need for collecting specialized data, such as blow counts.

24. Attachment A, Closure Plan, Sampling and Analysis Plan, Section 6.8, Soil Gas Samples, Page 6 of 8: The GSU discourages the use of PRT for soil vapor sampling. All soil vapor probes are to be installed following the ASGI.

    Only properly constructed and maintained soil-vapor monitoring wells, sampled at a sufficient frequency to allow for decision-making, and also accounting for seasonal and temporal changes, will provide data that is representative of soil-vapor.

25. Attachment A, Closure Plan, Sampling and Analysis Plan, Section 7.3, Chip Samples and Core Samples, Page 1 of 2: The use of 4-ounce glass jars as containers for chip and concrete core samples for VOC analysis is considered to be bulk sampling which is inappropriate for collecting VOC samples. Collecting samples in this manner for VOC analysis may produce results that cannot be used for making a risk determination. Instead, VOC chip and core samples should be collected using pre-tared VOA vials capped with PFTE-lined septums.

    The SAP should reference, and include language that is in accord with, DTSC's *Guidance Document for the Implementation of United States Environmental Protection Agency Method 5035: Methodologies for Collection, Preservation, Storage, and Preparation of Soils to be*

Analyzed for Volatile Organic Compounds, or DTSC Method 5035 guidance, dated November, 2004.

26. Attachment A, Closure Plan, Sampling and Analysis Plan, Section 9.1, Field Notes, Page 1 of 3: The list of elements to be included in the field logbooks is still incomplete. In addition to what is listed in this section, field logbooks should include weather conditions, names/titles of visitors, equipment being used onsite, the type of activity, and the level of PPE.

27. Attachment A, Closure Plan, Sampling and Analysis Plan, Table 1, Sample Preservation, Holding Times, and Container Requirements: This table should be modified to include soil vapor sampling, groundwater and leak detection monitoring/sampling, and surface water sampling.

28. Attachment A, Closure Plan, Sampling and Analysis Plan, Table 2, Summary of Laboratory Methods and Quality Assurance Goals: As noted earlier, include EPA Method TO-15 sample analysis for VOCs in soil vapor. In addition, we had previously requested in earlier memoranda that Exide include laboratory detection limits for each compound. This should be included as a separate table in the SAP.

Questions regarding the memorandum should be directed to Todd Wallbom at (818) 717-6622.